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LOGISTIC PILLARS AT THE OPERATIONAL LEVEL OF WAR  
AND THE ROLE OF THE JOINT FORCE COMMANDER

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

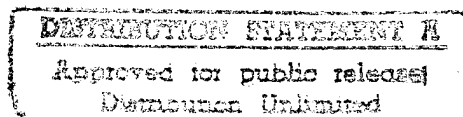
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## INTRODUCTION

*Strategy and tactics provide the scheme for the conduct of military operations; logistics provides the means therefor.*

Rear Admiral Henry E. Eccles  
Logistics in the National Defense<sup>1</sup>

Logistics plays a pivotal role in determining what is possible operationally based on what is logistically supportable. Existing literature on logistics is typically focused on either broad strategic concepts or detailed tactical tasks. These strategic concepts are often too vague to be useful at the operational level of war. The tactical tasks are so narrowly focused and dominated by technical functions that the reader is quickly overwhelmed with complex and detailed calculations.

In its broadest sense, logistic support is generated at the strategic level in the continental United States (CONUS) and dispensed at the tactical level to operating forces in the theater of war or theater of operations. The role of logistics at the operational level, and the part played by the operational commander, are not particularly clear.

This paper identifies the three key logistic pillars of preparing the theater, organizing the force, and managing resources at the operational level of war. In doing so, it provides a basis for understanding the critical role played by the joint force commander (JFC) in orchestrating the logistic support of his campaign or major operation.

## WHAT IS LOGISTICS?

*I don't know what the hell this "logistics" is that Marshall is always talking about, but I want some of it.*

Fleet Admiral E.J. King:  
To a staff officer, (1942)<sup>2</sup>

In simplest terms, logistics is "the process of planning and executing the movement and sustainment of operating forces in the execution of a military strategy and operations."<sup>3</sup> Logistics is frequently called the foundation of combat power and the bridge that connects a nation's economy to its warfighting forces. In the most comprehensive sense, logistics involves:

Those aspects of military operations which deal with:  
a. Design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and disposition of materiel; b. movement, evacuation, and hospitalization of personnel; c. acquisition or construction, maintenance, operation, and disposition of facilities; and d. acquisition or furnishing of services.<sup>4</sup>

Logistics is often characterized as both art and science. The art of logistics involves the seamless integration of support from the strategic level to the operating forces at the lowest levels on the battlefield. It also includes anticipating future requirements and operating environments. The science aspect involves numerous technical functions that often involve complex activities requiring detailed analysis (e.g., repair part stock level calculations).

### **Why is Logistics Important?**

Logistics is a force multiplier and is critical to the successful application of combat power. Logistics also significantly influences the timing, sequencing, and duration of combat operations. While adequate logistics cannot ensure success, logistic failures can inhibit a commander's flexibility and magnify risks. "A campaign plan that cannot be logistically supported is not a plan at all, but simply an expression of fanciful wishes."<sup>5</sup>

There are numerous examples where logistics was a decisive factor in the conduct of military operations. A recent example is Operation DESERT SHIELD where logistics drove the initial operational plans and capabilities. In another example from World War II, "logistics was a constant and overriding factor in the conception, planning, and execution of the Normandy invasion in June 1944."<sup>6</sup>

### **Logistic Functions and Principles**

All levels of logistics involve the sustainability of operating forces. They specifically include six broad functional areas: supply, maintenance, transportation, general engineering, health services, and other services (e.g., laundry, postal, graves registration).

Similar to the principles of war, the seven logistic principles serve as guides in evaluating alternatives and in assessing effectiveness, efficiency, and risk. They include:

**Responsiveness:** the right support in the right place at the right time

**Simplicity:** avoidance of complexity

**Flexibility:** the ability to adapt logistic structures and procedures to changing situations, missions, and concepts of operation

**Economy:** provision of support at the least cost

**Attainability:** the ability to provide the minimum essential supplies and services required to begin combat operations

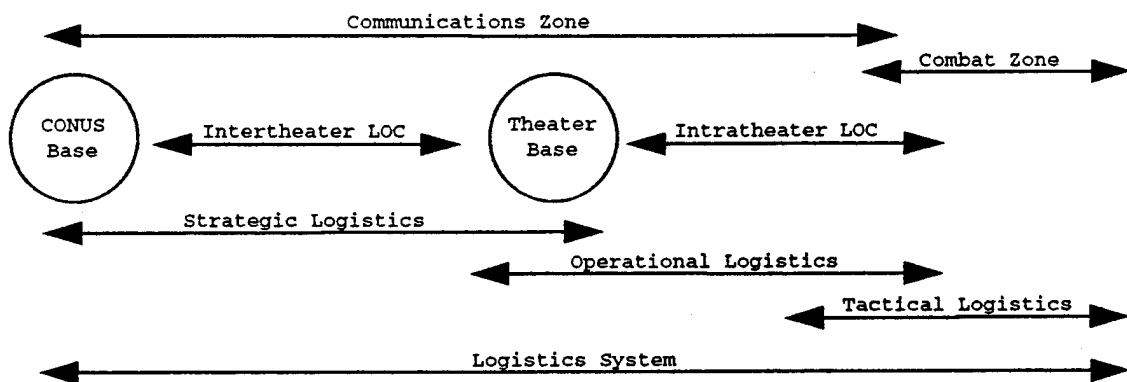
**Sustainability:** the ability to maintain logistic support for the duration of the operation

**Survivability:** capacity of the organization to prevail in the face of potential destruction<sup>7</sup>

### The Logistic Continuum and the Levels of War

Like the levels of war, there are three levels of logistics: strategic, operational, and tactical. As shown in Figure 1, each level overlaps the other to form a continuum of support from the strategic to the tactical level.

Figure 1  
The Logistic Continuum<sup>8</sup>



Strategic logistics involves mobilizing and allocating the economic power of the nation to support military operations. The Joint Staff, military departments and services, defense agencies, and the U.S. Transportation Command focus on



marshaling the strategic resources needed to generate, project, and sustain combat forces. This includes the delivery of logistic support from CONUS (or another theater) to the theater base.

At the other end of the continuum, tactical logistics focuses on the day-to-day readiness of operating forces and is used to affect the combat actions in progress. Technical functions dominate logistics at the tactical level. Examples of tactical logistics include the repair of equipment and the distribution of food, water, fuel, and ammunition.

Logistics at the operational level differs from the tactical level in the scale of operations conducted and the longer planning horizon. Operational logistics requires a theater perspective and is the "foundation for successful operational planning and execution."<sup>9</sup> Today it is almost always a joint and is sometimes a combined effort. At the operational level, logistics is both a force multiplier and a constraint. "Bridging the gap between the two great E's — the efficiency of strategic logistics and the effectiveness of tactical logistics — is the challenge of the operational logistics art."<sup>10</sup>

#### **Who Provides Logistic Support?**

*Logistics is also a function of command. To have control over the strategic, operational, and tactical levels of war, one must also have control over logistics.*

Doctrine for Logistic Support of Joint Operations, Joint Pub 4-0<sup>11</sup>

Logistics is a service, and in the case of a coalition or multinational effort, a national responsibility. At the theater level, logistic support is normally accomplished through the service component commanders.

Combatant commanders (CINCs) exercise directive authority for logistics in their theater (and may delegate directive authority for a common support capability). This includes:

the authority to issue to subordinate commanders directives, including peacetime measures, necessary to ensure the effective execution of approved operation plans, the effectiveness and economy of operation, and the prevention or elimination of unnecessary duplication of facilities and overlapping of functions among the service component commands.<sup>12</sup>

This directive authority provides a CINC with the means to ensure that logistics is in harmony with the concept of operations. CINCs may also designate a service component to provide common item support if they determine that common servicing is beneficial. Joint task force commanders do not enjoy directive authority for logistics.

The JFC is responsible for reviewing logistic requirements, establishing priorities, apportioning and allocating resources, and ensuring that logistic plans are integrated and coordinated. JFCs must be proactive and closely monitor logistic support planning and execution since they provide the ability to mass and sustain combat power and underwrite the concept of operations.

In addition to the logistic staff (J-4), a JFC may establish a number of joint logistic centers, offices, and boards to assist in the coordination and oversight of the logistic effort. Examples include the Joint Transportation Board, Joint Movement Center, Joint Blood Program Office, and the Joint Materiel Priorities and Allocation Board.

#### **LOGISTIC PILLARS AT THE OPERATIONAL LEVEL OF WAR**

*It sometimes appears that the logistic aspect of war is nothing but an endless series of difficulties succeeding each other. Problems constantly appear, grow, merge, are handled forward and backward, are solved and dissolved only to reappear in a different guise.*

Martin Van Creveld, Supplying War:  
Logistics from Wallenstein to Patton <sup>13</sup>

Operational logistics provides the connection between the strategic and tactical ends of the logistic continuum. Viewing operational art through a logistic prism helps to identify those concepts, functions, and tasks that are critical to success at the operational level. These essential elements can be categorized into three logistic pillars: preparing the theater, organizing the force, and managing resources.

#### **Logistic Preparation of the Theater**

Logistic preparation of the theater is analogous to intelligence preparation of the battlefield. It is critical to the successful deployment and sustainment of operating forces. Careful analysis and planning are required in order

to identify existing logistic infrastructure and the potential for host-nation support. As part of this process essential elements of information and other requirements are identified and included in the overall intelligence collection effort.

In today's force-projection world, existing logistic infrastructure (e.g., ports, airfields, and road networks) is essential to the introduction of forces and drives initial planning efforts. Airfields that can accommodate strategic airlift aircraft, including commercial passenger aircraft, are needed to rapidly deploy forces. Another key factor is the need for adequate ports capable of handling large ships. Historically "85-95 percent of all material, in terms of tonnage, will arrive in theater by sea."<sup>14</sup> Ports, airfields, and staging areas are particularly important when forces need to link up with prepositioned material. Recent operations, including Operation DESERT SHIELD and Operation RESTORE HOPE, have relied on the early introduction of equipment and supplies from prepositioning ships.

A key element early in the planning process is the concept of logistic support. This concept integrates operational and logistical considerations and provides an overall view of how forces, equipment, and supplies will be deployed to and sustained in the theater. The concept of logistic support is an outgrowth of the estimate of logistic supportability made during the assessment of alternative courses of action.

The concept of logistic support is guided by and directly supports the commander's intent and concept of operations. Matching capabilities and resources, this concept provides a theater level perspective and describes how operations will be supported. It also provides guidance on logistic tasks and responsibilities, including host-nation support, and addresses other issues needed to foster unity of effort and flexibility. The concept also organizes support from the CONUS to the combat zone. It helps planners "avoid focusing solely on the deployment problem at the expense of sustaining the employment concept of the campaign."<sup>15</sup>

Careful analysis and planning for the utilization of host-nation support is essential. During Operation DESERT SHIELD initial host-nation support, especially in the areas of food, water, and transportation, was significant. In contrast, Operation RESTORE HOPE was a logistic nightmare and "deploying to Somalia was like going to the moon: everything needed had to be brought in or built there."<sup>16</sup>

A relatively recent initiative is the Logistics Civil Augmentation Program (LOGCAP) which is managed by the Army. It involves a civilian contractor who provides selected logistic support such as transportation and other base support within a theater. LOGCAP was used extensively during operations in Somalia and Haiti and significantly reduced the burden placed on military units. LOGCAP may also prove useful

when theater responsibilities are transferred to another organization (e.g., the United Nations).

Finally, logistic preparation of the theater and the concept of logistic support should promote flexibility and provide responsiveness and reach. Since a commander will rarely have all of the resources he desires, logistic support must be flexible. Logistic support should not unnecessarily restrict the options available and must quickly adapt to change. The responsiveness and reach of logistics will largely govern the tempo of operations and may dictate the timing (phases) of operations. For example, the need to shift units and establish forward logistic support bases during Operation DESERT SHIELD/DESERT STORM dictated the timing of the ground attack phase of the campaign.<sup>17</sup>

#### **Organizing the Logistic Force**

The second of the logistic pillars is organizing the logistic force. The JFC must create a logistic structure that can effectively control the support forwarded to the theater by the strategic logistic system and distribute this support to tactical units. This command direction is essential since "logistics itself has no purpose other than to create and to support combat forces which are responsive to the needs of command."<sup>18</sup>

Establishing command and control over logistics includes defining support relationships. This includes any support

relationship between subordinate commands, coalition or multinational partners, and the providers of strategic logistics. Support requirements of nongovernmental organizations and private voluntary organizations are also a consideration.

Effective command and control provides focus to the logistic effort and helps to minimize the diversion of potential combat power. One of the keys to effective command and control is assured communications. Logistic support is heavily dependent on communications to transmit the vast quantities of data needed to manage resources and control the logistic pipeline.

Another key element in organizing the logistic force is striking the right balance between centralized control and decentralized execution. Too much centralization can stifle initiative and lead to slow and unresponsive support, while too little can lead to inefficiencies in the control of scarce resources. Centralized control at the operational level promotes efficiency while decentralized execution provides flexible and responsive support to tactical units.

As noted earlier, the services are responsible for the logistic support of their forces. A service component, usually the dominant user, may be tasked to provide common support for a particular function or for a specific geographic area within the theater. Examples include subsistence, bulk

petroleum, ammunition, host-nation contracting activities, and medical support. Common support promotes efficiency by preventing unnecessary duplication, eases the demand on strategic lift, and reduces the size of the logistic footprint.

In organizing the logistic force, careful attention to the time-phased force and deployment data (TPFDD) is critical. The TPFDD details the sequence in which units, equipment, and supplies will arrive in the theater. "Crucial to the successful reception, onward movement, sustainment, and protection of projected forces is the correct determination and timely introduction of the support force structure into the theater."<sup>19</sup>

Considering the threat and available host-nation support, the JFC must strike a balance between the deployment of combat forces and logistic forces. During Operation DESERT SHIELD, the CINC initially chose to accelerate the introduction of combat forces based on the Iraqi threat. This action, however, delayed the arrival of logistic forces. This resulted in a perilously heavy demand on host-nation support and other logistic assets available in the theater.

Finally, the JFC must recognize that many logistic support units, particularly in the Army, are reserve units. Reserve units need time to mobilize and deploy. In addition, the



number of units and period (duration) of active duty may be limited particularly in operations other than war.

### **Managing Logistic Resources**

The third logistic pillar is managing logistic resources. The first step in managing logistic resources is forecasting requirements. These forecasts are based on the available theater infrastructure, the number and composition of forces, the concept of operations, and the anticipated duration of the operation. These initial planning forecasts help to define the types and quantities of logistic support required.

As part of the planning process, the JFC must balance current consumption with the need to build up stock levels for future operations. Analyses may dictate that operational pauses or phases are required in order to provide sufficient opportunity to build up the required logistic support.

Logistic requirements, the concept of logistic support, decisions regarding the organization of the force, and the availability of logistic resources determine priorities. These priorities in turn guide the sequencing of forces into the theater and the apportionment of logistic resources during the deliberate planning process. During crisis action planning and execution, priorities determine the actual allocation of available logistic resources. Priorities also provide focus for the logistic effort and help to minimize the inefficient use of scarce resources.

To assist in the prioritization process, the JFC may establish a Joint Materiel Priorities and Allocation Board to recommend priorities for the allocation of materiel assets. Another example might be to establish a Joint Transportation Board to establish priorities and allocate common-user transportation resources within the theater.

Fundamental to effective and efficient logistic support is control over the logistic pipeline. The logistic pipeline is the artery through which resources move from CONUS (or another theater) to operating forces in the combat zone. This pipeline includes the intertheater transportation system, the theater base, and the intratheater transportation and distribution system used to provide support to tactical units.

Critical to success at the operational level is controlling the timing and quantity of resources provided by the strategic logistic system to the theater base. Another significant challenge in the logistic pipeline is management of the throughput capability of the theater ports and airfields. The amount of supplies needed to support modern combat operations is staggering as illustrated by the VII Corps and VIII Airborne Corps during the ground offensive in Operation DESERT STORM. The "fuel consumption by the two corps approached 4.5 million gallons per day, or 880 truckloads. One day's worth of ammunition for the VII Corps weighed 9,000 tons, and constituted 450 truckloads."<sup>20</sup>

Adequate ports and airfields are critical to intertheater logistic support and sustainment. Few countries in the world, however, have the modern infrastructure that was available in Saudi Arabia. Many countries, particularly in Sub-Saharan Africa, have few ports that can accommodate the large ships used to provide strategic sealift. Inadequate ports may require logistics-over-the-shore (LOTS) operations to move equipment, cargo, and supplies across the beach. LOTS is more time consuming than discharging cargo at a pier and may require the introduction of specialized units and equipment.

Similar challenges to throughput exist if available airfields have limited capacity. While the runway may accommodate large aircraft, inadequate parking ramps may limit the number of aircraft that can off-load simultaneously. The shortage of ramp space in Mogadishu, Somalia was a limiting factor during the initial phases of Operation RESTORE HOPE.<sup>21</sup> The threat of enemy action, particularly weapons of mass destruction, can also limit throughput capability.

The theater base receives the logistic support provided through the theater ports and airfields. From the theater base, lines of communication (LOC) extend outward to provide intratheater distribution to tactical units. Controlling and protecting LOCs is a significant challenge given the volume of material and distances involved. To control this segment of the logistic pipeline, the JFC may establish a Joint Movement

Center to coordinate all means of transportation, including host-nation support, within the theater.

The importance of LOCs was illustrated during Operation DESERT STORM when the VII Corps and VIII Airborne Corps were repositioned prior to the initiation of the ground offensive. "For 18 critical days, 18-wheelers were transporting combat equipment and material, passing one point on the westward road every minute, every hour, 24 hours a day."<sup>22</sup>

#### **Implications for the Joint Force Commander**

Logistic support of a campaign or major operation is a complex process that requires the personal attention of the JFC. The JFC must be sensitive to the interrelationship between operational decisions and logistic support. The logistic staff must thoroughly understand the commander's intent and concept of operation. They also must remain actively engaged in all aspects of the planning process.

One way the JFC can influence logistic support at the operational level is to use the three logistic pillars of preparing the theater, organizing the force, and managing resources. These pillars help the JFC focus on those areas where he needs to establish priorities and provide guidance to ensure that logistics is integrated with other elements of operational art. For "only a commander who understands logistics can push the military machine to the limits without risking total breakdown."<sup>23</sup>

## CONCLUSION

Logistics influences every aspect of operational planning and execution. To a large extent, what is possible operationally depends on what is logistically supportable. Operational logistics provides the connection between the strategic and tactical ends of the logistic continuum and is critical to the massing and sustainment of combat power.

One of the mechanisms the JFC can use in orchestrating logistic support is to use the three logistic pillars of preparing the theater, organizing the force, and managing resources. By using these pillars, the JFC can focus the logistic effort and ensure that the support provided is effective, efficient, and flexible.

Since the services are responsible for the logistic support of their forces, the JFC focuses on prioritizing requirements, allocating resources, and managing the logistic pipeline. The JFC uses his logistic staff and a variety of logistic centers, offices, and boards to assist him in the coordination and control of the logistic effort. Ultimately, the JFC must be personally involved in logistics to ensure that it complements his intent and concept of operations, provides unity of effort, and is responsive to his needs.

## NOTES

<sup>1</sup>Henry E. Eccles, Logistics in the National Defense (Harrisburg, PA: The Stackpole Company, 1959), 19.

<sup>2</sup>Ernest J. King, quoted in Robert D. Heinl Jr., Dictionary of Military and Naval Quotations (Annapolis, MD: United States Naval Institute, 1966), 175.

<sup>3</sup>U.S. Joint Chiefs of Staff, Doctrine for Logistic Support of Joint Operations, Joint Publication 4-0 (Washington: 1995), I-1.

<sup>4</sup>U.S. Joint Chiefs of Staff, Department of Defense Dictionary of Military and Associated Terms, Joint Publication 1-02 (Washington: 1994), 221.

<sup>5</sup>John F. Meehan III, "The Operational Trilogy," Parameters, Autumn 1986, 16.

<sup>6</sup>James A. Huston, The Sinews of War: Army Logistics 1775-1953 (Washington: Office of the Chief of Military History, U.S. Army, 1966), 523.

<sup>7</sup>Joint Publication 4-0, II-1 to II-4.

<sup>8</sup>Adapted from Joint Publication 4-0, I-2.

<sup>9</sup>William G. Pagonis and Michael D. Krause, Operational Logistics and the Gulf War, The Land Warfare Papers, no. 13, (Arlington, VA: The Institute of Land Warfare, Association of the United States Army, October 1992), 14.

<sup>10</sup>James A. Brabham, "Operational Logistics: Defining the Art of the Possible," Marine Corps Gazette, April 1994, 26.

<sup>11</sup>Joint Publication 4-0, I-3.

<sup>12</sup>Joint Publication 4-0, vi.

<sup>13</sup>Martin Van Creveld, Supplying War: Logistics from Wallenstein to Patton (Cambridge, NY: Cambridge University Press, 1977), 231.

<sup>14</sup>Brabham, 27.

<sup>15</sup>Joint Publication 4-0, VIII.

<sup>16</sup>Joseph P. Hoar, "A CINC's Perspective," Joint Force Quarterly, Autumn 1993, 60.

<sup>17</sup>Norman H. Schwarzkopf, It Doesn't Take a Hero (New York: Bantam Books, 1992), 395.

<sup>18</sup>Eccles, 9.

<sup>19</sup>U.S. Army Department, Army Operational Support, FM 100-16 (Washington: 31 May 1995), 2-12.

<sup>20</sup>William G. Pagonis, Moving Mountains: Lessons in Leadership and Logistics from the Gulf War (Boston, MA: Harvard Business School Press, 1992), 147.

<sup>21</sup>Hoar, 60.

<sup>22</sup>Pagonis and Krause, 9.

<sup>23</sup>Julian Thompson, The Lifeblood of War: Logistics in Armed Conflict (London: Brassey's (UK), 1991), 342.

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